ORDER DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8110.27A

SUBJ: CAR 4b.383 and FARs 25.855 and 25.857, CARGO COMPARTMENT CLASSIFICATION REQUIREMENTS

1. PURPOSE. This order is pertinent to all certificated airplanes engaged in cargo operations and should be used for guidance when approving Class A through Class E cargo compartments.

2. DISTRIBUTION. This order is distributed to the branch levels in all Flight Standards offices in Washington, regions, and Aeronautical Center; to all General Aviation, Air Carrier, Engineering and Manufacturing, and Flight Standards District Offices; and to all International, International Aviation, and Aeronautical Quality Assurance Field Offices.

3. CANCELLATION. Order 8110.27 dated 11/9/76, is cancelled.

4. BACKGROUND.

a. In the interest of fire protection, classification of cargo compartments on transport category airplanes was developed and incorporated into a rule with CAR Amendment 04-1 on November 1, 1946. Class A, B, and C categories were established, and two basic factors of fire protection were envisioned:

(1) Detection of a fire by a crewmember while at his station.

(2) Extinguishment of the fire when detected.

b. Later a Class D compartment was developed and incorporated into a rule with CAR Amendment 4b-6 on July 20, 1950. Further, when a need developed for bulk loading cargo into the main cabin in which the fire protection provision of the Class A, B, C, D did not suffice, a Class E category was established. The Class E was incorporated into a rule with CAR Amendment 4b-10 on April 23, 1959. The basic category provisions are essentially the same to date in current FAR 25 requirements. Main differences in classification are:

(1) Accessibility.

(2) Means of detection of fire or smoke.

(3) Method of extinguishment or suppression of fire.

(4) Protection for structural members.

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c. Questions have been raised by some regions concerning these differences in classification and, therefore, some explanatory information is needed.

5. PROCEDURE.

a. Each cargo compartment categorized as Class B, C, D, and E must have a fire resistant liner which protects the primary structure. In those cases where the floor of a normal passenger cabin is used for cargo and satisfies the requirements for fire resistant liner, the underside of this flooring cannot be used as lining for below the floor cargo or baggage compartments.

b. The Class A cargo compartment applies to small open compartments used for storage of crew luggage and located in the cockpit area where a fire can be easily discovered by a crewmember. Due to the small size of the Class A compartment, a fire resistant liner is not required for protection of structural members, as is required for the Class B, C, D, and E. The Class B, C, and D are larger compartment areas which can be remote from the cockpit area. The Class E was developed for airplanes configured for all cabin cargo operations.

c. Smoke/fire detectors used in the Class B, C, and E cargo compartments do not generally satisfy the "easily discovered" requirement of Class A compartment due to the lag between fire initiation and the development and propagation of smoke and heat to the point where the detector will react.

6. DISCUSSION.

a. As prescribed in CAR 4b and FAR 25, the Class A requires that the presence of a fire be readily discernible to a crewmember at his station and that all parts be easily accessible. The Class B must also be accessible, but detection is by smoke/fire detectors. The Class C, D, & E are not accessible and detection in the C and E are by smoke/fire detectors. Extinguishment in the Class C is by flooding, in the Class D by suppressing oxygen, and in the Class E by shutting off the ventilating airflow. Fire resistant liners are required in the Class B, C, D, & E for protection of structural members.

b. With the exception of the Class E, which was designed to encompass the entire passenger cabin, no specific volume limits were prescribed for the other category compartments. Early regional policy, however, envisioned the Class A compartment as a small open container for storage of crew luggage located in the cockpit where the presence of any fire could be rapidly detected by the crew.

c. During the 74/75 Airworthiness Review, it was mentioned that full cabins or other large cargo compartments were presented for approval under Class A category, and that these compartments were consistently rejected on the basis that their volume was outside the intent of the Class A category where a fire must be rapidly detected and extinguished. Since the Class A compartment has no liner, large cargo areas have been considered to be outside the intent of the Class A category. It was recommended to limit the volume to 200 cubic feet. Some regions have reported a recent upsurge in requests from applicants for approval of full fuselage Class A cargo compartments on older airplanes phased-out of scheduled air carrier service, such as Martin 404 and McDonnell Douglas DC-6A/B and DC-8. There have been additional requests for approval of full fuselage cargo compartments without detectors but with liner and vice versa. The Class A is particularly attractive because there is no requirement for liner or fire/smoke detector. The guidance material outlined above is for the purpose of assuring approvals will meet the intent of the rule. Previous approvals not commensurate with this order will not be accepted as precedent.

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